

# NFPA 13R / 13D

Rick St Louis - DSPS

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# Overview

- NOT ALL INCLUSIVE
- NOT A TECHNICAL DESIGN COURSE
- History of the standards
- Where can they be installed
- General requirements
- Some specific requirements
- General design parameters

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# NFPA 13D Origin and History

- Recognizing the need to reduce the annual life loss from fire in residential occupancies (about 50 percent of total loss of life by fire), the Committee on Automatic Sprinklers appointed a subcommittee in May 1973 to prepare the *Standard on the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes*. The subcommittee was composed of members of the Committee on Automatic Sprinklers and other technically competent experts.
- The standard was submitted and adopted at the NFPA Annual Meeting in Chicago, Illinois, on May 12–16, 1975.
- The **1980** edition was a complete rewrite of the 1975 edition and **incorporated the results of the residential sprinkler test program**
- The 1984 edition made modifications based on the practical experience using the 1980 edition,
- The **1989 and 1991** editions established some of the installation criteria associated with **specially listed piping materials**.
- The **1994** edition provided expanded information on **nonmetallic pipe**.
- The **1996** edition addressed residential sprinklers near heat sources. For the first time since 1941, the **use of 1/2 in. piping material was permitted** again for sprinkler systems under specific conditions (MPP).
- The 1999 edition revised criteria for certain types of MPP systems and the exception for omitting sprinkler coverage in attics and crawl spaces was modified.
- The 2002 edition established a minimum design discharge density. Added some requirements for MPP system.

# NFPA 13D Origin and History

- Current **2007** addresses **sloped ceilings, ceiling pockets, fans, kitchen cabinets**, installation, design, and acceptance requirements for **pumps**. The acceptability of insulation as a method of freeze protection and the acceptability **of wells as a water source have been clarified**. New requirements dry pipe/preaction systems, clarified requirements for multi-purpose combined and networked sprinkler systems and specific obstruction rules have been added for residential sprinklers.

# NFPA 13R Origin and History

- The first edition of NFPA13R, which **was published in 1989**, represented a milestone in the development of sprinkler installation design standards. The first edition resulted in a standard for the protection of **low-rise, residential facilities**. This standard is **intended to provide a higher degree of life safety and property protection to the inhabitants of low-rise, multifamily dwellings**. Promulgated as a document that provides for increased levels of protection to building occupants, the document also considers the economic aspects of a sprinklered facility as compared to an unsprinklered facility. As the number of states and cities that implement sprinkler ordinances continues to grow, and as the threshold levels for sprinkler requirements in residential occupancies in the building codes extend to certain low-rise structures, it is believed that systems for certain residential occupancies can be efficiently and effectively installed in accordance with this standard.
- The 1994 edition provided expanded information on nonmetallic pipe materials, clarified the established design criteria, and a new recommendation on underground pipe materials.
- The **1996** edition included several changes that **paralleled amendments in the 1996 edition of NFPA 13, *Standard for the Installation of Sprinkler Systems***. Other changes included a number of clarifications concerning the selection of sprinklers as well as the proper use of sprinklers.
- The **1999** edition clarified criteria for nonmetallic pipe and fittings and **established a minimum operating pressure for sprinklers**. Guidance on providing freeze protection, exceptions for omitting sprinkler coverage in closets on balconies and underneath garage doors were added.

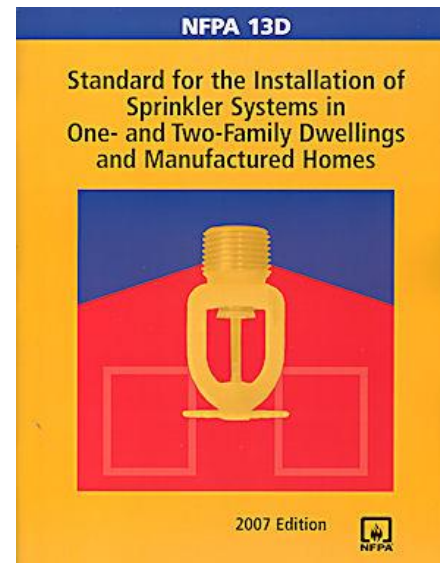
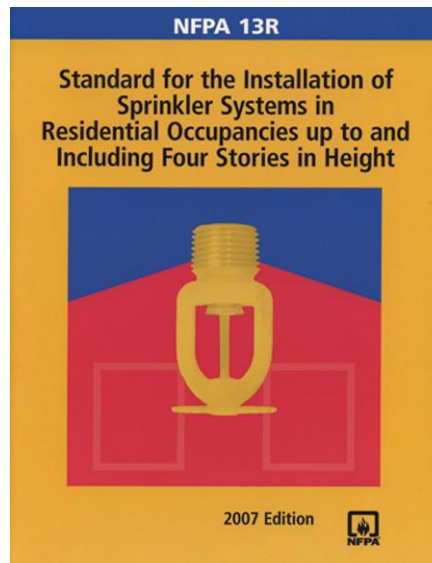
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# NFPA 13R Origin and History

- The **2002** edition clarified the scope of the standard, **established a minimum design discharge density**, and added protection requirements specifically for garages. **The area of full-height tub/shower enclosures is to be included in the area determination for bathrooms**, sprinklers would be provided in concealed spaces with fuel-fired equipment, and the omission of sprinklers in elevator machine rooms would not be dependent on the room's location.
- This **2007** edition addresses **sloped ceilings, ceiling pockets, ceiling fans, and kitchen cabinets**. For this edition, the requirements for utilizing quick-response sprinklers within NFPA 13R regulations were clarified, and new requirements addressing architectural features within dwelling units were added. Additionally, the requirements covering closets, including obstructions within closets and protection of mechanical closets, were clarified.

# Wisconsin Codes and Standards

- SPS 361 adopts the 2009 Edition of the IBC
  - Chapter 9 – fire protection systems
  - Chapter 35 – editions of referenced Standards
- 2007 Editions of NFPA 13R and 13D





# Where Permitted by IBC

- NFPA 13R
  - IBC 903.3.1.2 permits NFPA 13R in Group R occupancies up to and including four stories in height.
- NFPA 13D
  - IBC 903.3.1.3 permits NFPA 13D in one-and two-family dwellings and townhouses.



# Wisconsinisms for Group R

## **SPS 362.0903 Automatic fire sprinkler systems**

- (5)** Group R. Substitute the following wording for the requirements in IBC section 903.2.8:
  - (a) Except as provided in pars. (b) to (d), an automatic sprinkler system installed in accordance with IBC section 903.3 shall be provided throughout all buildings with a Group R fire area.

# Wisconsinisms for Group R (07/01/2013)

Occupancy	Threshold	Exceptions
R, Multifamily	Sprinklers Required	<b><u>13D/MPP</u></b> for multifamily dwellings that comply with <u>all</u> of the following: ≤4 dwelling units. ≤2 stories in height. Not served by either a community water system or a municipal water system as defined under s. NR 811.02
R, Townhouse	Sprinklers Required	<b><u>13D/MPP</u></b> for townhouses that comply with <u>all</u> of the following: ≤3 stories in height. Each dwelling unit within the townhouse is separated from other dwelling units by at least one hour fire-resistive-rated separation walls constructed in accordance with the requirements of IBC section 706* and do not contain any openings or have any plumbing equipment or mechanical equipment within.

\*The separation wall does not have to comply with the structural stability requirements of IBC section 706.2 and the horizontal continuity requirements of IBC section 706.5.

# Wisconsinisms for Group R

Occupancy	Threshold	Exceptions
R-3, bunkhouse	Sprinklers Required	<p><b><u>13D/MPP</u></b> for buildings with Group R-3 fire areas provided they comply with all of the following: Group R-3 use is a single-room bunkhouse type sleeping unit.</p> <p>Fire area <math>\leq 1,500</math> square feet.</p> <p>Fire area is <math>\leq</math> one story above grade in height.</p> <p>Fire area has an occupant load <math>\leq 10</math>.</p> <p>Not served by either a community water system or a municipal water system.</p>

# 13D Wisconsinism

- SPS 362.0903(10)
- Where allowed, automatic sprinkler systems in townhouses and multifamily dwellings shall be installed throughout in accordance with NFPA 13D, except as provided in par. (b).
  - (b) 1. The requirements in NFPA 13D section 6.3 (4)\* are not included as part of this code.
  - 2. Fire department connections are prohibited in MPP piping systems.

\*Permitted by the local plumbing or health authority

# General Requirements

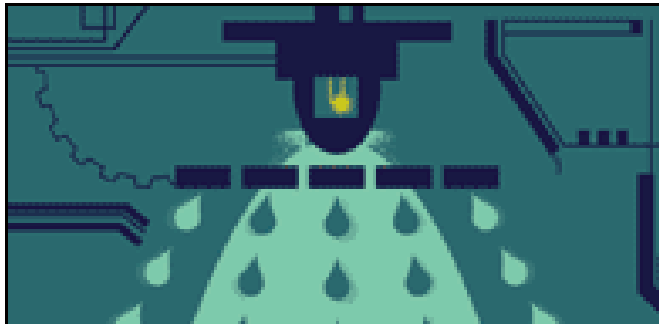
## ■ System Types

### □ 13R

- Wet
- Dry
- Pre-action
- Anti-freeze

### □ 13D

- Wet
- Dry
- Pre-action
- Anti-freeze
- Multi-Purpose Piping (MPP)



# General Requirements

- **System Types**

- **NFPA 13D**

- **Multipurpose Piping Sprinkler System.** A piping system intended to serve both domestic needs in excess of a single fixture and fire protection needs from one common piping system throughout the dwelling unit(s).



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# General Requirements

## ■ Compartments

### □ NFPA 13R

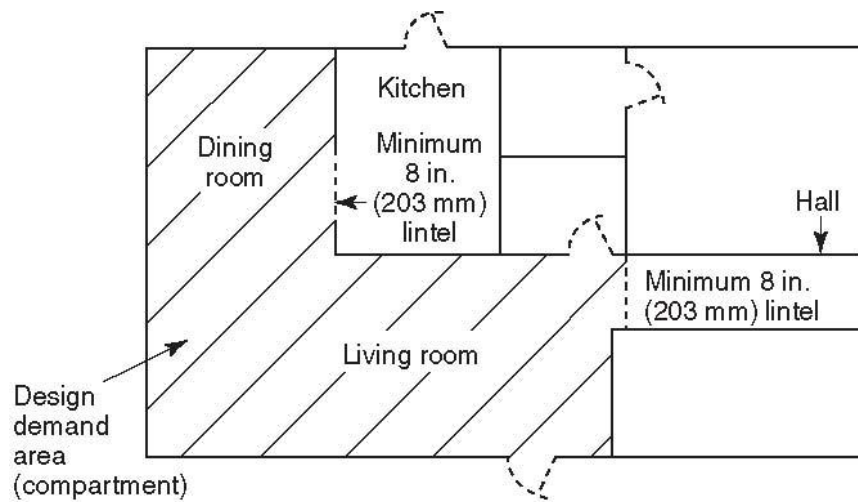
- A space completely enclosed by walls and a ceiling. The compartment enclosure is permitted to have openings in walls to an adjoining space if the openings have a minimum lintel depth of 8 in. (203 mm) from the ceiling and the openings do not exceed 8 ft (2.4 m) in width. A single opening of 36 in. (914 mm) or less in width without a lintel is permitted when there are no other openings to adjoining spaces.

### □ NFPA 13D

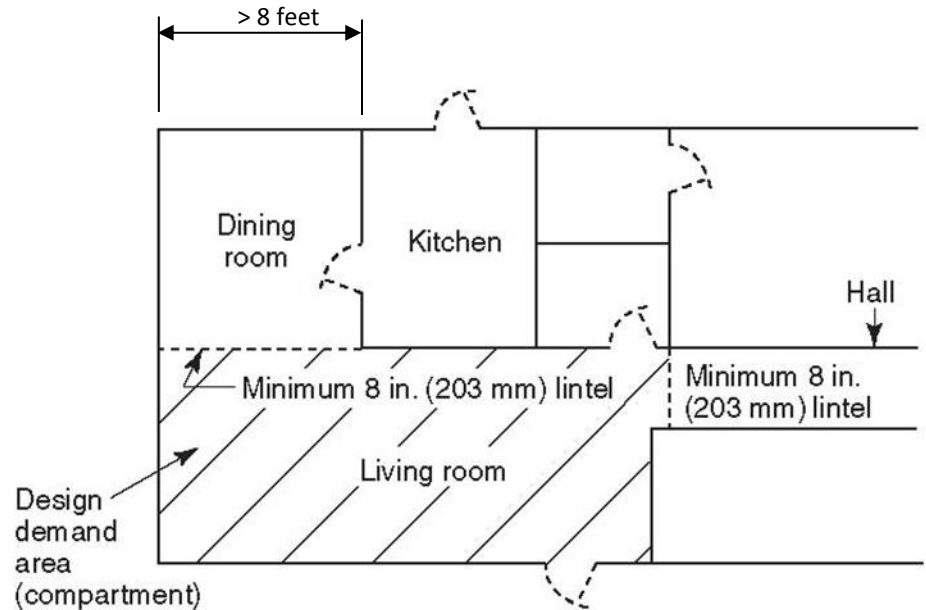
- A space completely enclosed by walls and a ceiling. Each wall in the compartment is permitted to have openings to an adjoining space if the openings have a minimum lintel depth of 8 in. (203 mm) from the ceiling.
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# Compartments – NFPA 13D

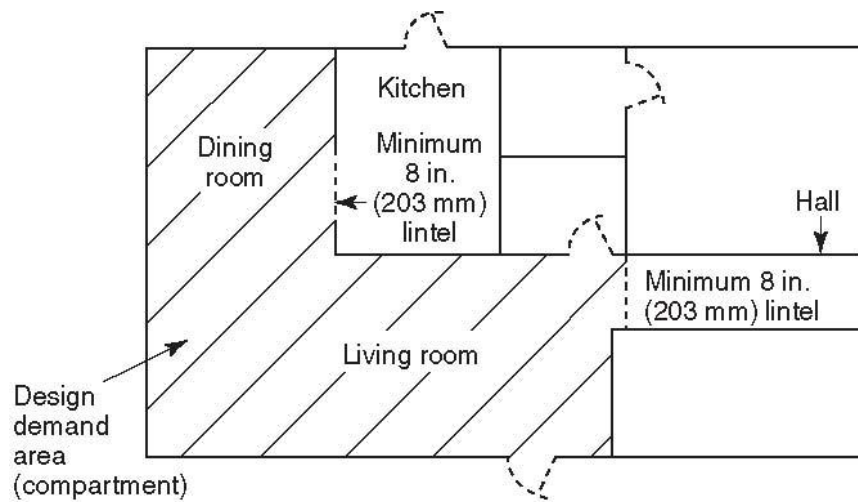


**Without Lintel**

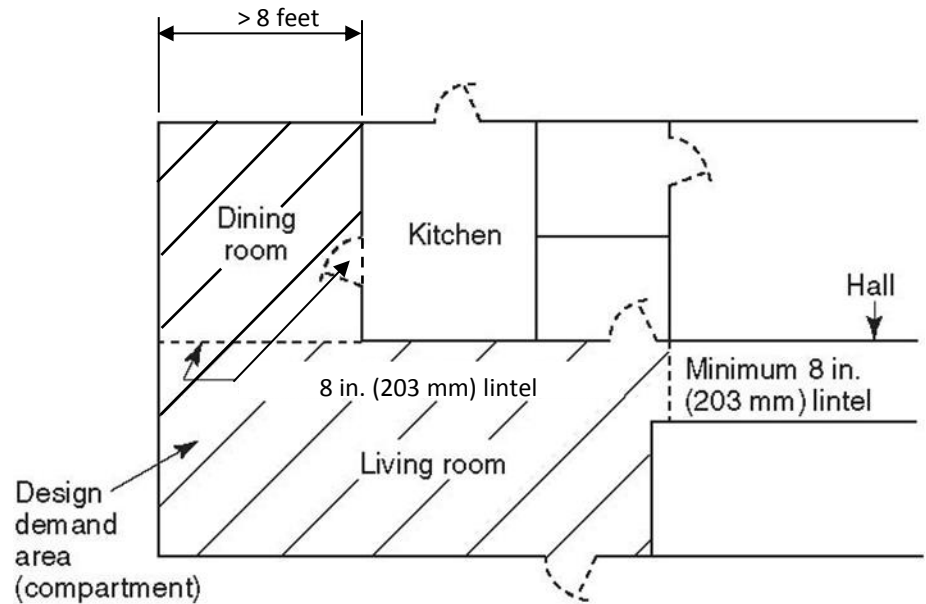


**With Lintel**

# Compartments – NFPA 13R



**Without Lintel**



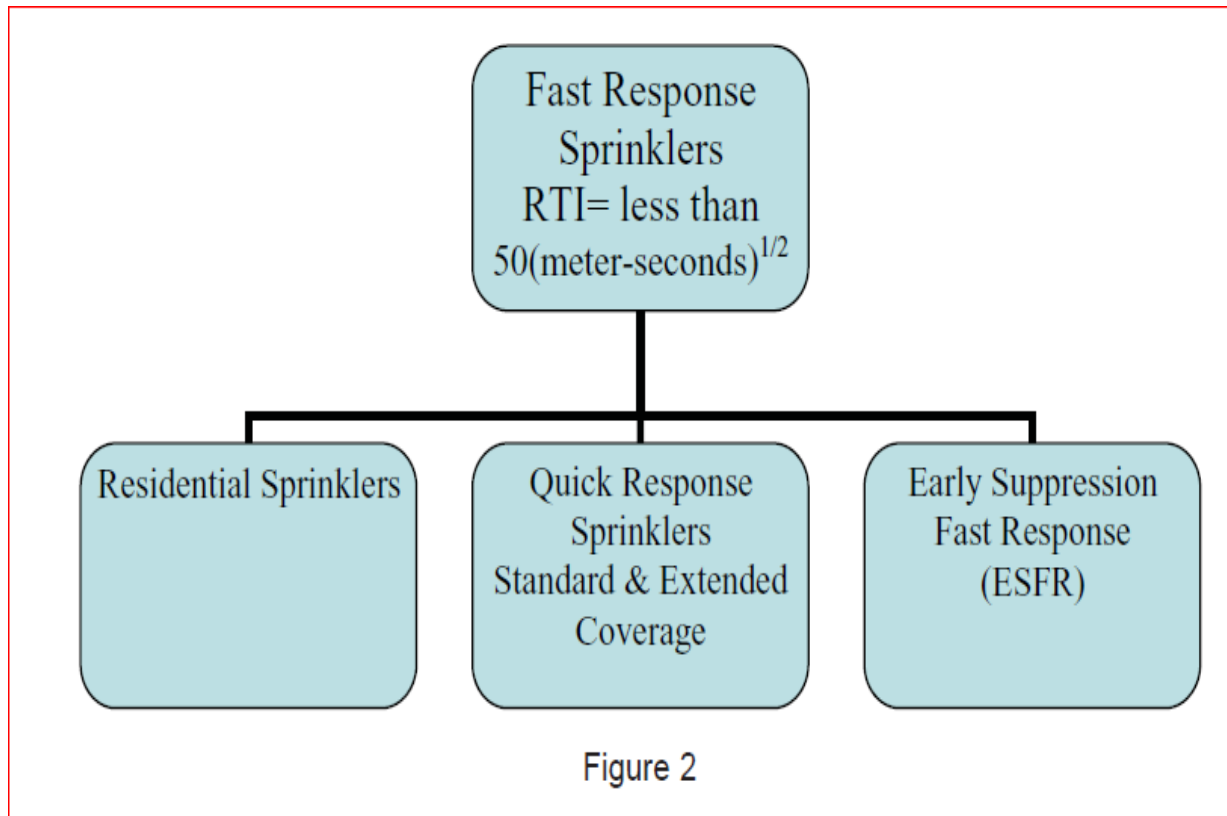
**With Lintel**

# Sprinklers

- Coatings or finishes must be factory applied
- Area per sprinkler per NFPA 13R/13D or listing
- Temperature Ratings, Coverage, K-factors
- Response Time Index



# Sprinklers



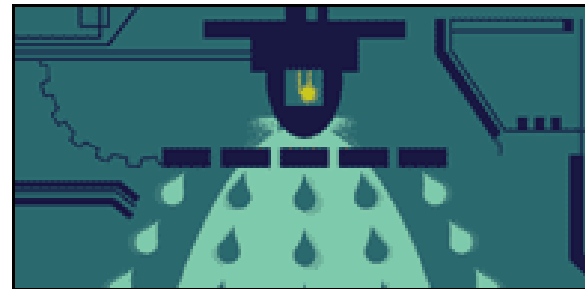
# Response Time

- Quick Response Sprinkler

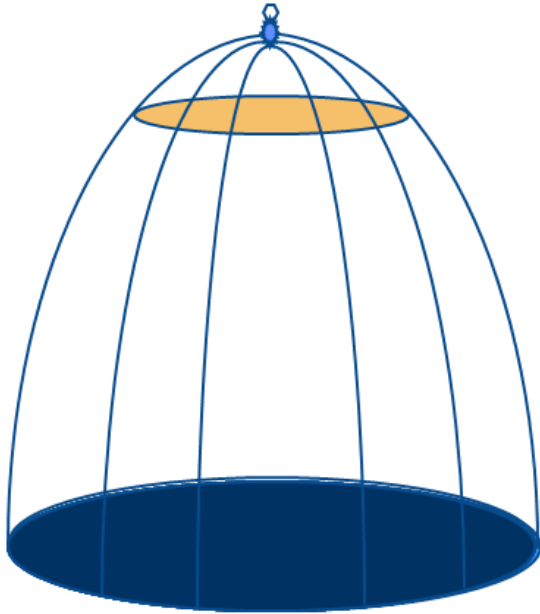
- A type of spray sprinkler that meets the fast response criteria and is listed as a quick-response sprinkler for its intended use.

- Residential Sprinkler

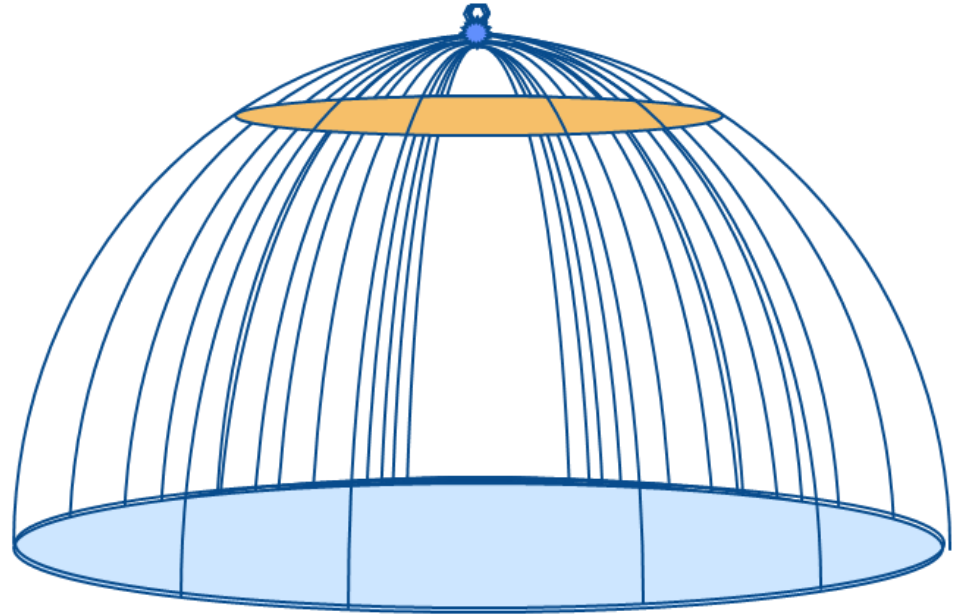
- A type of fast-response sprinkler having a thermal element with an RTI of 50 (meters-seconds)<sup>1/2</sup> or less, that has been specifically investigated for its ability to enhance survivability in the room of fire origin and that is listed for use in the protection of dwelling units.



# Spray Pattern



**QR Sprinkler**



**Residential Sprinkler**

# Sprinkler Types

- Quick Response
  - Pendent
  - Sidewall
  - Upright
- Residential
  - Pendent
  - Sidewall
  - Upright



RESIDENTIAL  
HORIZONTAL  
SIDEWALL



RESIDENTIAL  
RECESSED  
HORIZONTAL SIDEWALL



RESIDENTIAL  
RECESSED PENDENT



RESIDENTIAL  
PENDENT

# Temperature Classification

Maximum Ceiling Temp. (°F)	Temperature Rating (°F)	Temperature Classification
100	135-170	Ordinary
150	175-225	Intermediate
225	250-300	High
<del>300</del>	<del>325-375</del>	<del>Extra High</del>
<del>375</del>	<del>400-475</del>	<del>Very Extra High</del>
<del>475</del>	<del>500-575</del>	<del>Ultra High</del>
<del>625</del>	<del>650</del>	<del>Ultra High</del>



135 °F



155 °F



175 °F



200 °F



280 °F



300 °F

*\* Residential Sprinklers*   *\* Quick Response Sprinklers*



# Temperature Classification

## ■ NFPA 13R

- Sprinklers outside of the dwelling units shall be quick-response, and selection shall be based on the requirements of NFPA 13, Standard for the Installation of Sprinkler Systems

## ■ NFPA 13D

- Sprinklers shall be ordinary temperature rated (135-170° F)
- Exceptions:
  - Sprinklers under glass or plastic skylights
  - Sprinklers under uninsulated roofs or in unventilated attics or concealed spaces Table 6.7.7.1.5.3
  - Sprinklers installed near specific heat sources that are identified in Table 7.5.5.3 shall be of the temperature rating indicated in Table 7.5.5.3 unless sprinklers are listed for positioning closer to the heat source.

# Residential Sprinklers

- NFPA 13R
  - ❑ Required inside dwelling units
  - ❑ Permitted outside dwelling unit in lobbies (not in hotels and motels), foyers, corridors, halls, lounges and other areas with fire loads similar to residential.
  - ❑ Garages that are accessible only from a single dwelling unit.



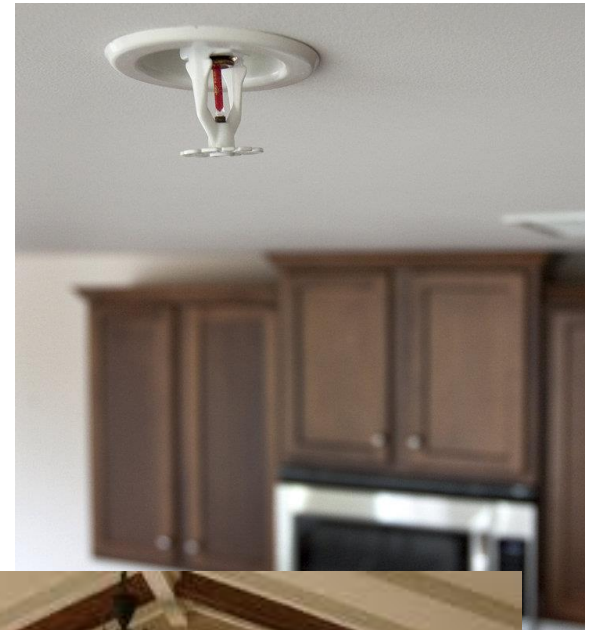
# Residential Sprinklers

- NFPA 13D

- Only allows listed Residential sprinklers throughout.

Exception:

- Standard dry-pendent or dry-sidewall sprinklers shall be permitted to be extended into unheated areas not intended for living purposes.
    - Quick-response sprinklers shall be permitted to be used in mechanical closets.



# Quick Response Sprinklers

## ■ NFPA 13R

- Required outside dwelling units – per NFPA 13 (Quick Response Sprinklers)
- Permitted in the dwelling unit if:
  - No more than four sprinklers are located in the dwelling unit.
  - The density/area requirement shall be a minimum of 0.1 gpm/ft<sup>2</sup> over the entire dwelling unit.
  - Where extended coverage quick response sprinklers are used, the flow shall be sufficient to meet the listing of the sprinklers at the spacing for which they are being used.
- Permitted in mechanical closets. Such sprinklers shall be capable of discharging a minimum of 0.1 gpm/ft<sup>2</sup>

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# Quick Response Sprinklers

- NFPA 13D

- Quick-response sprinklers shall be permitted to be used in mechanical closets.
- Dry-pendent or dry-sidewall sprinklers shall be permitted to be extended into unheated areas not intended for living purposes.

# Where can Sprinklers be Omitted

## ■ NFPA 13R

- ❑ Sprinklers shall not be required in bathrooms where the bathroom area does not exceed 55 sq. ft.
- ❑ Sprinklers shall not be required in clothes closets, linen closets, and pantries within dwelling units that meet all of the following conditions:  $\leq 24$  sq. ft., smallest dimension  $\leq 3$  feet, walls and ceilings are surfaced with noncombustible or limited combustible materials
- ❑ Sprinklers **are required** in any closet with HVAC equipment



# Where can Sprinklers be Omitted

## ■ NFPA 13R

- Sprinklers are not be required in attics, penthouse equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment crawl spaces, floor/ceiling spaces, noncombustible elevator shafts, and other concealed spaces that are not used or intended for living purposes or storage and do not contain fuel fired equipment.
- Sprinklers shall not be required in closets on exterior balconies, regardless of size as long as there are no doors or unprotected penetrations from the closet directly into the dwelling unit.

# Where can Sprinklers be Omitted

## ■ NFPA 13D

- Sprinklers shall not be required in bathrooms where the bathroom area does not exceed 55 sq. ft.
- Sprinklers shall not be required in clothes closets, linen closets, and pantries within dwelling units that meet all of the following conditions:  $\leq 24$  sq. ft., smallest dimension  $\leq 3$  feet, walls and ceilings are surfaced with noncombustible or limited combustible materials





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# Where can Sprinklers be Omitted

## ■ NFPA 13D

- Sprinklers shall not be required in attics, penthouse equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment, floor/ceiling spaces, elevator shafts, crawl spaces, and other concealed spaces that are not used or intended for living purposes and do not contain fuel-fired equipment.
  - Sprinklers shall not be required in covered unheated projections of the building at entrances/exits as long as the dwelling unit has another means of egress.
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# Design

## ■ Criteria

### ■ NFPA 13R

- ❑ Include all sprinklers within the compartment to a maximum of 4
- ❑ Minimum discharge of 0.05 gpm/sf to the design sprinkler or 7psi
- ❑ Per the sprinkler listing which provides 0.05 gpm/sf
- ❑ Outside the Dwelling
  - Reference NFPA 13 for only the sprinkler discharge (flow and pressure), number of design sprinklers and position of sprinklers.
  - NFPA 13R does not reference the hose stream demand, protection of combustible concealed spaces and water supply duration.

### ■ NFPA 13D

- ❑ Include all sprinklers within the compartment to a maximum of 2
  - ❑ Minimum of 18 gpm for one or 13 gpm/sprinkler for two or 7psi
  - ❑ Per the sprinkler listing which provides 0.05 gpm/sf
-

# Spacing

## ■ Residential sprinklers

Occupancy Hazard	NFPA 13R	NFPA 13D
Inside Dwelling Unit	Per Listing	Per Listing
Outside Dwelling Unit – Similar to Residential	Per Listing	N/A
Light Hazard (*Outside Dwelling Unit – under 500 SF)	225 SF per head or Per Listing	N/A
Ordinary Hazard (*Outside Dwelling Unit – under 500 SF)	130 SF per head or Per Listing	N/A

**\* Per exception of NFPA 13R 6.8.2.2**

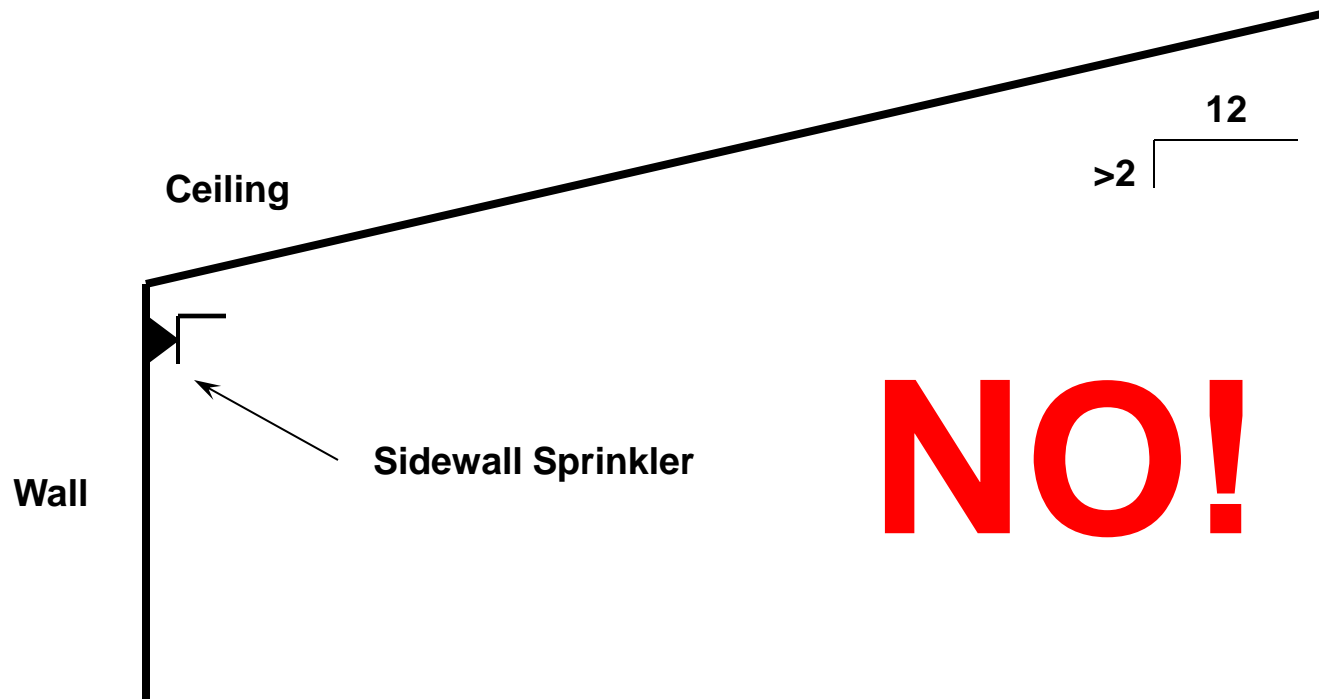
# Spacing

## ■ Quick Response Sprinklers

Occupancy Hazard	NFPA 13R Per NFPA 13	NFPA 13D
Inside Dwelling Unit	225 SF or per listing	Per Listing only in mechanical closets
Light Hazard – Outside Dwelling Unit	225 SF or per listing	N/A
Ordinary Hazard - Outside Dwelling Unit	130 SF or per d	N/A

# Spacing – Ceiling Slope (cont.)

- **Question:** Are there currently any sidewall sprinklers listed to be installed at the bottom of the ceiling slope when exceeding a 2 in 12 pitch?



# Pipe

- NFPA 13R - All the typical pipe types from 13
  - Including CPVC



- NFPA 13D - All the typical pipe types from 13R
  - Adds Polybutylene (PB)
  - MPP – Wisconsin
    - SPS 384.30



# Fittings

## ■ NFPA 13R

- Typically the same as NFPA 13
- Fittings used in sprinkler systems shall be designed to withstand a working pressure of not less than 175 psi including nonmetallic fittings



## ■ NFPA 13D

- Typically the same as NFPA 13R
- Nonmetallic fittings used in multipurpose piping systems not equipped with a fire department connection shall be designed to withstand a working pressure of not less than 130 psi at 120° F
- MPP Systems – Wisconsin
  - ❑ Must comply with SPS 384 or Table 384.30-10 as well as NFPA 13D



# Hangers

- NFPA 13R
  - ❑ Must conform to requirements of NFPA 13 Chapter 9
  - ❑ Must be ferrous material unless specifically listed for FP
  - ❑ Cannot be used to support non-system components





# Hangers

- NFPA 13D
  - If piping is listed, hangers are also required to be listed
  - If piping is not listed for hanging requirements, hangers shall be utilized comparable to local plumbing codes
    - CPVC – Listed
    - PEX – Not Listed
  - MPP Systems
    - Must comply with SPS 382.6 including spacing in table 382.6



# Alarms

## ■ NFPA 13R

- A local waterflow alarm shall be provided on all sprinkler systems
- Where a building fire alarm system is provided, the local waterflow alarms shall be connected to the building fire alarm system.
- Water flow alarms shall be installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems

## ■ NFPA 13D

- Local waterflow alarms shall be provided on all sprinkler systems in homes not equipped with smoke alarms or smoke detectors in accordance with NFPA 72, National Fire Alarm Code

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# Valves

## ■ NFPA 13R

- Shall not close in less than 5 seconds when operated at maximum possible speed from the fully open position
- All valves controlling connections to water supplies and to supply pipes to sprinklers shall be listed indicating valves

### Exceptions:

- Listed underground gate valve with a listed indicator post.
  - A listed water control valve assembly with a reliable position indication connected to a remote supervisory station shall be permitted
  - A nonindicating valve, such as an underground gate valve with approved roadway box, complete with T-wrench, and where accepted by the authority having jurisdiction
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# Valves

- NFPA 13D

- Not required to be listed
- A single control valve arranged to shut off both the domestic system and the sprinkler system shall be installed
- A separate valve is allowed if supervised by:
  - Central station, proprietary, or remote station alarm service
  - Local alarm service that causes the sounding of an audible signal at a constantly attended location
  - Valves that are locked open

# Fire Department Connections

## ■ NFPA 13R

- At least one fire department connection shall be provided for buildings that exceed 2000 square feet
- At least 1 ½ in size
- Must be labeled for what building or area it covers or protects



## ■ NFPA 13D

- No fire department connection is required.
  - Prohibited in multi-purpose piping systems
- SPS 362.0903(10)



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# Drains & Test Connections

## ■ NFPA 13R

- ❑ Each sprinkler system shall have a drain on the system side of the control valve
  - ❑ The drain pipe shall be at least 1 in. nominal diameter and shall be arranged so that it can drain all portions of the system
  - ❑ A valve shall be installed in the drain piping
  - ❑ Each sprinkler system shall have a test connection
  - ❑ The test connection pipe shall be at least 1 in. nominal diameter and terminate in an orifice equal to or smaller than the same size as the smallest sprinkler installed in the system.
  - ❑ A valve shall be installed in the test connection piping.
-

# Drains & Test Connections

## ■ NFPA 13D

- ❑ Each sprinkler system shall have a drain on the system side of the control valve
- ❑ A valve shall be installed in the drain piping
- ❑ Where waterflow alarms are provided, inspector's test connections shall be installed at locations that allow flow testing of water supplies, connections, and alarm mechanisms
- ❑ The inspector's test connections shall contain an orifice equal to or smaller than the smallest sprinkler installed in the system.

# Signs

## ■ NFPA 13R

- All control, drain, and test connection valves shall be provided with permanently marked weatherproof metal or rigid plastic identification signs
  - The identification sign shall be secured with corrosion-resistant wire, chain, or other approved means.
  - The control valve sign shall identify the portion of the building served.
  - Systems that have more than one control valve that must be closed to work on a system or space shall have a sign referring to the existence and location of other valves.
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# Signs

## ■ NFPA 13D

- Warning Sign. A sign shall be affixed adjacent to the main shutoff valve that states in minimum 1/4 in. letters, “Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign.”
-

# Water Supply

## ■ NFPA 13R

- The water supply shall be capable of supplying the system demand for at least 30 minutes
- The water supply source shall be one of the following:
  - A connection to a reliable waterworks system with or without a pump, as required
  - An elevated tank
  - A pressure tank installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, and NFPA 22, Standard for Water Tanks for Private Fire Protection
  - A stored water source with an automatically operated pump
    - Shall be installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection or
    - Pump not listed for fire protection systems but provided with the same redundancy and reliability as a waterworks system pump (back-up power, back-up pump)

# Water Supply

- NFPA 13R
  - Domestic demand shall be included as part of the overall system demand for systems with common domestic/fire mains where no provisions are made to prevent the domestic water flow upon sprinkler system activation



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# Water Supply

## ■ NFPA 13D

- Where stored water is used as the sole source of supply, the minimum quantity shall be permitted to equal the two sprinkler water demand rate times 10 minutes
  - Where stored water is used as the sole source of supply, the minimum quantity shall be permitted to equal the two sprinkler water demand rate times 7 minutes where dwelling units meet the following criteria:
    - One story in height
    - Less than 2000 ft<sup>2</sup> (186 m<sup>2</sup>) in area
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# Water Supply

- NFPA 13D

- The following water supply sources shall be considered to be acceptable by this standard:

- A connection to a reliable waterworks system with or without an automatically operated pump.
- An elevated tank.
- A pressure tank designed to American Society of Mechanical Engineers(ASME) standards for a pressure vessel with a reliable pressure source.
- A stored water source with an automatically operated pump.

- A well with a pump of sufficient capacity and pressure to meet the sprinkler system demand. The stored water requirements shall be permitted to be a combination of the water in the well (including the refill rate) plus the water in the holding tank if such tank can supply the sprinkler system.

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# Water Supply

- NFPA 13D

- MPP

- In common water supply connections serving more than one dwelling unit, 5 gpm shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler.



# Ceiling Fans

- NFPA 13R/13D

- Residential Pendent are to be located at least **3 ft.** from the center line of the ceiling fan
- Residential Sidewalls are to be located at least **5 ft.** from the centerline of the ceiling fan

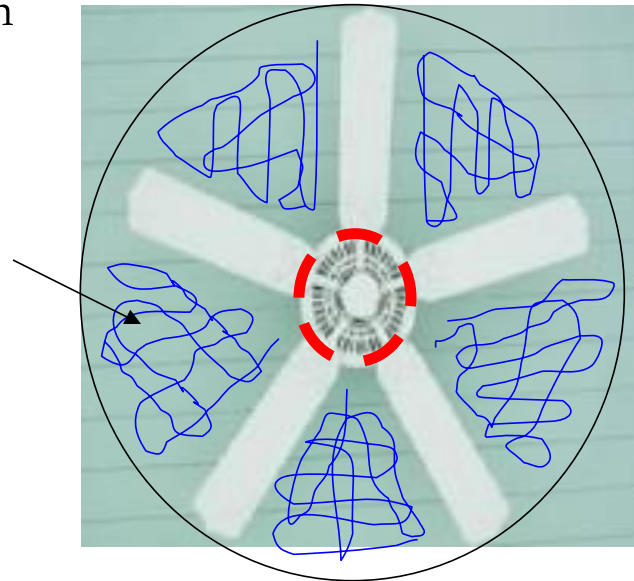


# Ceiling Fans

## ■ NFPA 13R/13D

- 13D 8.2.5.2.4 / 8.2.5.3.4 and 13R 6.8.1.5.3.2(D) / 6.8.1.5.3.3(D) Sprinklers shall be permitted to be placed without regard to the blades of ceiling fans, provided the plan view of the fan is at least 50 percent open. Otherwise it is treated as a continuous obstruction

**Shaded area indicates at least 50% of circular area**



The housing unit is expected to be treated as a solid continuous obstruction.



# Ceiling Pockets

- NFPA 13R
  - All ceiling pockets are required to be protected
  - Exception:
    - $\text{Volume} \leq 100 \text{ ft}^3$
    - $\text{Depth} \leq 12 \text{ in.}$
    - Entire floor area of ceiling pocket protected at lower ceiling.
    - Each pocket is separated from adjacent pockets by at least 10 feet.
    - Interior finish of ceiling pocket is noncombustible or limited combustible



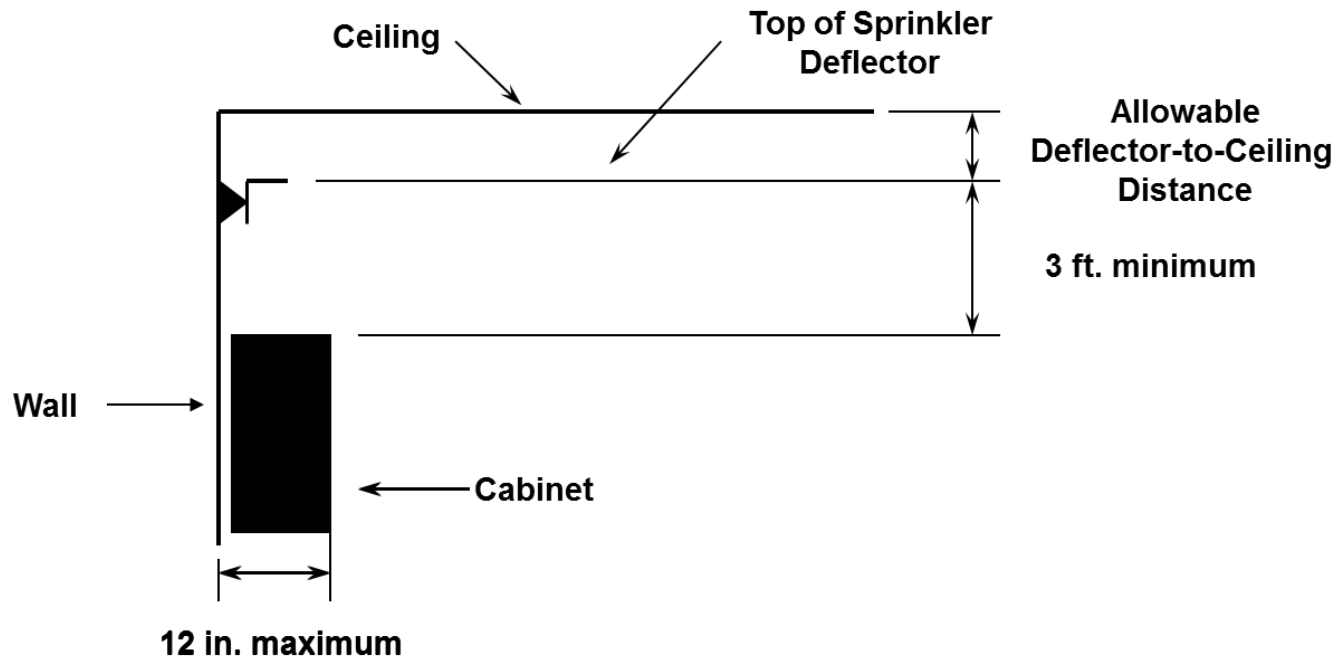
# Ceiling Pockets

- NFPA 13D
  - Sprinklers shall not be required for ceiling pockets that meet the following conditions:
    - Includes the exceptions from NFPA 13R
    - Depth is not an issue
    - Adds skylights not exceeding 32 ft<sup>2</sup> shall be permitted to have a plastic cover.



# Obstruction at Sidewall Sprinkler

- NFPA 13R /13D
  - When cabinets are installed directly below sprinklers, no additional sprinkler is required when the cabinets are 12" maximum and located a minimum of 3 feet below sprinkler deflector



# Obstruction at Sidewall Sprinkler

- NFPA 13R /13D



# Garages

- NFPA 13R

- Three Options

- Garage completely separated from residential portion of building by fire-resistive construction sufficient to consider as separate buildings. Protect per NFPA 13 (Overhead garage doors considered an obstruction)
    - Accessible by people from more than one dwelling unit. Protect per NFPA 13 – Outside dwelling unit (Overhead garage doors not considered an obstruction)
    - Accessible by people from a single dwelling unit. Protect as part of dwelling unit with Residential or Quick Response Sprinklers (Overhead garage doors not considered an obstruction)



# Garages

- NFPA 13D
  - Sprinklers shall not be required in garages, open attached porches, carports, and similar structures.





# Basements

- NFPA 13R
  - If unfinished would consider it to be outside of the dwelling unit and design should be in accordance with NFPA 13 requirements
  - If finished as a living space can be treated as part of the dwelling unit.



# Basements

- NFPA 13D
  - In basements where ceilings are not required for the protection of piping or where metallic pipe is installed, residential sprinklers shall be permitted to be positioned in a manner that anticipates future installation of a finished ceiling. In other words residential pendent sprinklers would be allowed
  - CPVC installed in accordance with the listing and manufacturer's requirements.





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# Balconies

## ■ NFPA 13R

- ❑ Sprinklers shall not be required in any porches, balconies, corridors, and stairs that are open and attached.
- ❑ Wisconsin
  - **362.0903(9)** Substitute the following wording for the requirements in IBC section 903.3.1.2.1: Sprinkler protection **complying with NFPA 13** shall be provided for exterior balconies, decks and ground-floor patios of dwelling units where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch to 6 inches below the structural members, and a maximum distance of 14 inches below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

## ■ NFPA 13D

- ❑ Protection is not addressed, not required.

# Balconies

## ■ SPS 362.0903 (9) BALCONIES

- SPS 362.0903 (9) BALCONIES. What suppression system type(s) is this section applicable to, what part of NFPA 13 should be adhered to, and what constitutes a roof or deck above?

- **Answer:** This Wisconsin Amendment is only applicable to 13R systems that are installed in 4-story or less residential buildings of Type V construction. The design provisions such as the spacing, density, area, system type, etc. from NFPA 13 shall be adhered to. The intent of this section was not to adopt NFPA 13 Section 8.15.7 for when to apply sprinkler protection under exterior roofs or canopies.
- It is the State's interpretation that a roof, balcony, deck or other projection of greater than 2 feet within that story shall trigger the requirement for a sprinkler. The State will allow the typical 2' truss overhang with fascia board without sprinkler protection. Gutters shall not be taken into consideration when determining the dimension of the projection.

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# Balconies Case Study

- Case Study: Georgetown
  - Constructed in 2004
  - Apartment complex
  - Wood Frame with truss roof construction
  - Sprinkler system: NFPA 13R
  - Exterior: Vinyl siding
- Fire started on 3<sup>rd</sup> floor balcony
  - Spread to vinyl siding
  - Extended upward on exterior into attic

# Balconies Case Study



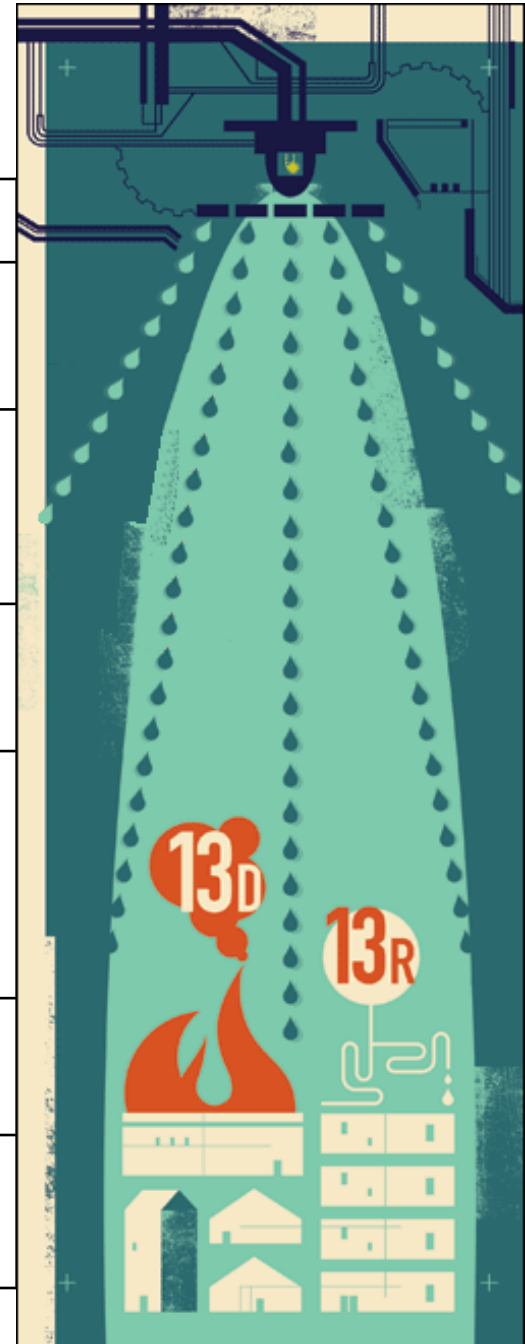
# Balconies Case Study





# Summary

	<b>NFPA 13R</b>	<b>NFPA 13D</b>
<b>Extent of Protection</b>	Occupied Spaces	Occupied Spaces
<b>Scope</b>	Low-rise Residential (4 stories or less)	One- and two-family dwellings
<b>Sprinkler design</b>	4-head design	2-head design
<b>Sprinklers</b>	Residential only (QR in some applications)	Residential only (Std. spray dry pendent & QR in mechanical closet)
<b>Duration</b>	30 minutes	10 minutes
<b>Advantage</b>	Life safety/tenability Property to a degree	Life safety/tenability



# Questions?



"I'LL SEE YOU ONE FIRE EXIT,  
AND RAISE YOU ANOTHER SPRINKLER SYSTEM."



Jeff tests the smoke alarm.

